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Family Health Dataline

IN THIS ISSUE

During 1998-99, among Medicaid enrolled persons <20 years of age in Alaska:

- The prevalence of any asthma-related claim was 6.9% with Alaska Natives having a 30% lower prevalence than non-Natives.
- Only 36% of hospitalized children received a long-term control medication (including steroids) indicating substantial underutilization.
- Alaska Natives were half as likely as non-Natives to have received a long-term control medication.
- 0.22% were hospitalized for asthma; Alaska Natives were 60% more likely to have been hospitalized for asthma than non-Natives.
- Among the subgroup of children residing in Anchorage, Alaska Natives had a higher asthma prevalence than non-Natives.

Asthma prevalence among Alaska residents less than 20 years of age enrolled in Medicaid

Introduction

Asthma is one of the leading causes of childhood morbidity in the developed world and the most common chronic childhood disease in the United States. Furthermore, asthma prevalence appears to be increasing. Although previous studies have evaluated asthma prevalence among minority populations, no evaluation has yet examined asthma among Alaska Natives. The current study was undertaken to evaluate asthma prevalence and asthma-related hospitalizations among Alaska Natives and non-Natives enrolled in Medicaid during 1998-99. Secondary evaluations examined demographic risk factors for asthma, the prevalence of long-term control medication use, and the cost of asthma.

Materials and Methods

Data source

Multiple data files were obtained from the Alaska Division of Medical Assistance. The master file consisted of all persons less than 20 years of age enrolled in Medicaid from July 1, 1998 through June 30, 1999. Throughout the study period, all agencies and providers billing Medicaid submitted claims for individuals. Data from before 1998 could not be analyzed because up to that point the Indian Health Service submitted Medicaid billing in batches, thus preventing analysis of outcomes by individual.

In addition to the master file, four files were obtained that contained all provider, inpatient facility, and outpatient hospital claims for International Classification of Diseases codes 493.0x-493.9x, the standard codes for asthma. A fifth subsidiary file was obtained for pharmacy claims paid by Medicaid. This file was limited to approved claims for standard asthma medications manufactured by any company. Cromolyn, nedocromil, salmeterol, leukotriene modifiers, methylxanthines, and inhaled steroids were classified as long-term control medications while short-acting inhaled and oral beta-agonists as well as ipratropium bromide were classified as quick-relief medications.

Case definitions

Asthma was defined as an approved claim for asthma-related medication use or care. Within this group, subgroups were also evaluated including persons with approved claims for 1) asthma-related medication, 2) asthma-related care (inpatient or outpatient), 3) both medication and care, and 4) asthma-related inpatient care.

Analysis

The one pharmacy and four services data files were linked to the master file by matching on a unique identifier number. Because asthma prevalence was the primary outcome of interest, all analyses (except those related to cost) were performed with the individual as the unit of analysis. Consequently, multiple visits or medications for a single person during the study year were ignored. The final database was constructed in such a way that – if they occurred – provider, inpatient, outpatient hospital, and pharmacy claims would each be identified in the single record analyzed for each individual. This allowed the calculation of asthma prevalence among the population of children enrolled in Medicaid.

Results

Prevalence and identification of risk groups

During the 1-year study period, 59,501 in-state residents under 20 years of age were enrolled in Medicaid and 4,131 had one or more claims for asthma-related care or medication. The overall asthma prevalence was 6.9%; 6.1% of children received asthma-related medication, 3.2% received asthma-related care, 2.3% received both medication and care, and 0.22% had an asthma-related hospitalization. Among all children with asthma, 3.1% had one or more hospitalizations. The proportion of children that experienced one of the measured outcomes was higher in males than females, children under 5 years of age than older children, and persons living in the Anchorage census area than those living in less populated areas (Table 1). Compared to non-Natives, the occurrence of asthma-related care and medication was lower among Alaska Natives but the proportion who were hospitalized was higher.

Among different census areas, overall asthma prevalence varied from 0 to 9.8%. The Southcentral and Southeast regions of Alaska – where the majority of the state's population resided during the study period – had the highest prevalences (Figure 1). In the three most populous census areas, Alaska Natives had asthma prevalences of 11%, 8.6%, and 10% (in descending order of population) compared to 9.4%, 7.2%, and 7.9% for non-Natives. In less populous census areas there was more variation between Alaska Native and non-Native asthma prevalences; much of this variation, however, might be attributed to the small number of cases at this level of stratification.

Multivariate risk factor analysis

Gender, Alaska Native status, age less than 5 years, and Anchorage residence were all entered simultaneously into the various multiple logistic regression analyses. Similar to univariate analyses, male gender, non-Native race, age less than 5 years, and living in the Anchorage census area were all associated with all outcomes except asthma-related hospitalization (Table 2). Male gender, Alaska Native race, and age less than 5 years were risk factors for asthma-related hospitalization.

In Alaska, Alaska Natives live predominantly in rural areas and

Table 1. The percent of Medicaid-enrolled in-state residents less than 20 years of age that experienced various asthma outcomes; Alaska, July 1998 through June 1999.

Risk Group	Any asthma-related medication or care		Any asthma-related medication		Any asthma-related care		Asthma-related medication + care		Asthma-related hospitalization	
	%	RR (95% CIs)	%	RR (95% CIs)	%	RR (95% CIs)	%	RR (95% CIs)	%	RR (95% CI)
Race										
Alaska Native (n=23,318)	5.5	0.70 (0.66, 0.75)	4.5	0.62 (0.58, 0.67)	2.4	0.67 (0.61, 0.74)	1.4	0.46 (0.41, 0.53)	0.28	1.6 (1.2, 2.3)
Non-Native (n=36,183)	7.9	Ref.	7.2	Ref.	3.6	Ref.	2.9	Ref.	0.17	Ref.
Gender										
Male (n=29,991)	7.5	1.2 (1.1, 1.3)	6.6	1.2 (1.1, 1.2)	3.6	1.3 (1.2, 1.4)	2.6	1.3 (1.2, 1.5)	0.26	1.5 (1.0, 2.1)
Female (n=29,510)	6.3	Ref.	5.6	Ref.	2.7	Ref.	2.0	Ref.	0.18	Ref.
Age group (in years)										
0-4 (n=19,977)	10	1.9 (1.7, 2.1)	9.1	1.9 (1.7, 2.1)	4.4	1.9 (1.7, 2.2)	3.2	2.0 (1.7, 2.4)	0.40	2.4 (1.4, 4.1)
5-9 (n=16,811)	5.1	0.95 (0.85, 1.1)	4.4	0.94 (0.83, 1.0)	2.7	1.2 (1.0, 1.4)	2.0	1.3 (1.0, 1.5)	0.12	0.71 (0.37, 1.4)
10-14 (n=13,176)	5.2	0.97 (0.87, 1.1)	4.7	1.0 (0.87, 1.1)	2.6	1.2 (0.98, 1.4)	2.1	1.4 (1.1, 1.6)	0.10	0.59 (0.28, 1.2)
15-19 (n=9,537)	5.4	Ref.	4.7	Ref.	2.3	Ref.	1.6	Ref.	0.17	Ref.
Census area of residence										
Anchorage (n=19,250)	10	1.8 (1.7, 1.9)	9.3	2.0 (1.9, 2.2)	3.9	1.4 (1.3, 1.5)	3.2	1.7 (1.5, 1.9)	0.21	0.94 (0.65, 1.4)
Non-Anchorage (n=40,251)	5.5	Ref.	4.6	Ref.	2.8	Ref.	1.9	Ref.	0.22	Ref.

non-Natives live predominantly in urban areas; Anchorage is the largest city and center for medical care in the state. To more clearly illustrate the risk of asthma associated with Alaska Native race independent of residence, data were first stratified into Anchorage or non-Anchorage residence. Then multiple logistic regression analysis was performed with Alaska Native race, male gender, and age less than 5 years entered simultaneously. For non-Anchorage residents, children with asthma were less likely to be Alaska Native than non-Native (OR, 0.65; 95% CI, 0.59 to 0.71). For Anchorage residents, though, children with asthma were more likely to be Alaska Native than non-Native (OR, 1.2; 95% CI, 1.1 to 1.3). A similar analysis was performed for hospitalizations. Among Anchorage residents, Alaska Native race was again associated with hospitalization (OR, 2.5; 95% CI, 1.3 to 4.7). For non-Anchorage residents,

though, Alaska Native race was not associated with hospitalization (OR, 1.5; 95% CI, 0.95 to 2.2).

Medication use

Among the 4,131 children with asthma, 86% received at least one quick-relief medication, 18% received at least one long-term control medication, and 10% received at least one inhaled steroid. Among the subgroup of 1,262 children who received both medication and care, 36% received a long-term control medication and 21% received an inhaled steroid. Among the subgroup of 129 hospitalized children, 36% received a long-term control medication and 23% received an inhaled steroid.

Long-term control medication and inhaled steroid use among risk groups was examined for hospitalized children and for children who had received an asthma-related medication and services (Table 3). Alaska Natives, children under 5 years of age, and non-Anchorage residents were less likely than non-Natives, older children, and Anchorage residents to have received long term control medications or inhaled steroids. These findings were most pronounced among children who had been hospitalized.

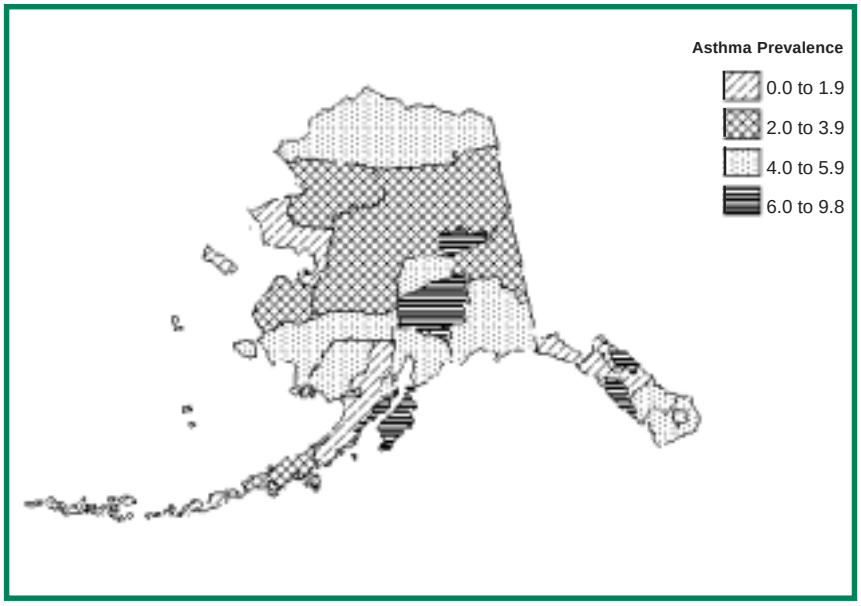

Figure 1. Geographic distribution of asthma prevalence (per 100 persons) in Alaska.

Cost

For this analysis, total claims rather than individuals were analyzed. During the 1-year study period, there were 4,527 provider, 819 outpatient facility, and 147 inpatient facility claims for asthma-related care as well as 9,029 claims for asthma-related medications. The total allowable billing for asthma-related

Table 2. Multiple logistic regression analysis for various asthma outcomes amont Medicaid-enrolled in-state residents less than 20 years of age; Alaska, July 1998 through June 1999.

Risk Group	Asthma-related medication or care		Asthma-related medication		Asthma-related care		Asthma-related medication + care		Asthma-related hospitalization	
	OR*	95% CI	OR*	95% CI	OR*	95% CI	OR*	95% CI	OR*	95% CI
Alaska Native	0.81	0.75, 0.87	0.73	0.68, 0.79	0.71	0.64, 0.79	0.51	0.45, 0.58	1.7	1.2, 2.4
Male	1.2	1.1, 1.3	1.2	1.1, 1.3	1.3	1.2, 1.5	1.3	1.2, 1.5	1.4	1.0, 2.0
Age <5 years	2.0	1.9, 2.2	2.0	1.9, 2.2	1.7	1.6, 1.9	1.6	1.5, 1.8	3.3	2.3, 4.7
Anchorage resident	1.8	1.7, 1.9	1.9	1.8, 2.1	1.3	1.1, 1.4	1.5	1.3, 1.6	1.1	0.71, 1.5

* Odds ratio

Table 3. Among Medicaid-enrolled in-state residents <20 years of age who received any asthma-related medication or care or who had been hospitalized for asthma, the percent who received any long-term control medication* or inhaled steroids alone; Alaska, July 1998

Risk Group	Received asthma-related medication and care				Had an asthma-related hospitalization			
	Long term medication		Inhaled steroid		Long term medication		Inhaled steroid	
	%	RR (95% CI)	%	RR (95% CI)	%	RR (95% CI)	%	RR (95% CI)
Race								
Alaska Native	33	0.88 (0.74, 1.0)	21	1.0 (0.82, 1.3)	26	0.54 (0.33, 0.88)	17	0.58 (0.30, 1.1)
Non-native	37	Ref.	20	Ref.	48	Ref.	29	Ref.
Gender								
Male	36	0.96 (0.83, 1.1)	20	0.91 (0.74, 1.1)	34	0.84 (0.53, 1.3)	17	0.55 (0.29, 1.0)
Female	37	Ref.	22	Ref.	40	Ref.	31	Ref.
Age group (in years)								
0-4	25	0.49 (0.40, 0.61)	8.6	0.23 (0.16, 0.32)	26	0.60 (0.31, 1.2)	11	0.30 (0.12, 0.73)
5-9	43	0.84 (0.69, 1.0)	26	0.68 (0.52, 0.90)	55	1.3 (0.64, 2.5)	40	1.1 (0.47, 2.4)
10-14	47	0.92 (0.75, 1.1)	33	0.86 (0.66, 1.1)	62	1.4 (0.70, 2.8)	46	1.2 (0.52, 2.9)
15-19	51	Ref.	38	Ref.	44	Ref.	38	Ref.
Census area of residence								
Anchorage	37	1.1 (0.92, 1.2)	22	1.1 (0.92, 1.4)	44	1.4 (0.86, 2.1)	35	2.1 (1.1, 4.0)
Non-Anchorage	35	Ref.	19	Ref.	33	Ref.	16	Ref.

* Long term medications included inhaled steroids, methylxanthines, cromolyn, nedocromil, salmeterol, and leukotriene modifiers

medical care and medications was $1,322,882. Asthma-related care or medication cost an average of $22 per person under 20 years of age enrolled in Medicaid and $320 per person with asthma. For Alaska Natives, costs were $16 per child enrolled in Medicaid and $290 per child with asthma while similar costs for non-Natives were $26 and $334.

Discussion

Among the Alaska Medicaid-enrolled population under 20 years of age, asthma prevalence was 6.9% while 0.22% were hospitalized with

asthma. Comparisons with other studies are problematic because of differing methodologies, particularly the case definition of asthma. Several similar studies of Medicaid populations suggest that asthma prevalence in other states is 1.5 to 2 times higher than in Alaska. The occurrence of hospitalization for asthma in Alaska is lower than in Michigan, comparable to Connecticut and higher than in Nebraska.

This is the first study to examine Alaska Native asthma prevalence. Among residents of the state's major urban center, Alaska Natives and non-Natives had similar asthma prevalences. This result is consistent with some studies (including those involving Native American populations) that have found that when controlling for potential confounding variables such as socioeconomic level and urban residence, minority populations do not have an increased risk of asthma. Among residents living outside of Anchorage, however, Alaska Natives had a substantially lower documented asthma prevalence. The reasons for this are not known.

Alaska Natives had a substantially higher prevalence of asthma-related hospitalizations than non-Natives did. Several potential reasons exist for this. Because provision of care in Alaska is largely stratified by Alaska Native status, differences in therapeutic strategies between care providers might contribute to different hospitalization rates. The only therapy-related outcome available for measurement – long-term control medication use – provided some support for this hypothesis since hospitalized Alaska Natives were significantly less likely than non-Natives to have received a long-term control medication, including inhaled steroids. Alternatively, the results may reflect a variety of biases, including differences between providers with respect to assigning a diagnosis of asthma and differences in provider or self-referral patterns for hospitalization.

Long-term control medication use, particularly inhaled corticosteroids, has become the accepted standard for ongoing asthma management. Use of these medications in the current study population, however, was low, particularly among high-risk children. While some subpopulations were particularly unlikely to have received long-term control medications – such as Alaska Natives and younger children – long-term control medication use was low among all groups evaluated. Low steroid use among all populations studied suggests that statewide education programs emphasizing the potential benefits of steroid and other long-term control medication use may be warranted.

Recommendations

- Increase asthma therapy education programs for care providers, particularly with respect to the benefit of inhaled steroids.
- Further evaluation of the reasons for the high proportion of Alaska Native children being hospitalized.
- Further evaluation of data over multiple years to evaluate asthma prevalence trends.
- Use uniform hospital discharge data to evaluate asthma hospitalization among the entire cohort of Alaska children.
- Establish asthma surveillance for the entire cohort of Alaska children.

Submitted by Brad Gessner, MD, MPH

Asthma Education Enters a New Frontier

Children and adults with asthma and allergies now have a new advocate in Alaska thanks to the newly formed Alaska Chapter of the Asthma and Allergy Foundation of America. Formed during April 2001, the AAFA Alaska Chapter is moving quickly to provide educational programs and information about asthma and allergies through classes, workshops, and educational materials. A primary focus of the AAFA Alaska Chapter is to reach not only children and adults with asthma information, but also health care professionals, caregivers, childcare providers and school personnel. Two upcoming workshops provided by the AAFA Alaska Chapter illustrate this nicely:

Indoor Air Quality Tools for Schools Program –
a workshop to help school officials assess, resolve, and prevent indoor air quality problems and reduce exposure to asthma triggers in school facilities.

Asthma and Allergy Essentials for Childcare Providers –
a 3-hour program will teach providers how to recognize the signs and symptoms of an asthma or allergy episode, how to institute environmental control measures to prevent these episodes, and how to properly use medications and other tools for asthma management.

In addition to these informative workshops, the AAFA Alaska Chapter also has teamed with Providence Alaska Medical Center to provide the **Asthma Care Training Program** for children ages 7 – 12 with asthma and their families. In this two-day, six-hour class, both the child and parents learn what asthma is, its triggers, warning signs and treatment, and how to make it easier to control. The goal of this interactive program is to help children and their parents learn how to work together with the child's healthcare professional to manage asthma and prevent emergencies.

For more information about the AAFA Alaska Chapter, please call 696-4810.

Submitted by Jeff Demain, MD
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